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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/530,319	11/05/2005	Guenter Hoenig	10191/3753	3633

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KENYON & KENYON LLP
ONE BROADWAY
NEW YORK, NY 10004

EXAMINER	
PRICE, CARL D	

ART UNIT	PAPER NUMBER
3749	

MAIL DATE	DELIVERY MODE
09/05/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/530,319	HOENIG ET AL.	
	Examiner	Art Unit	
	Carl D. Price	3749	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11 June 0208*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-12 and 14-22* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-12,14-22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *04/10/2008*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

Applicant's arguments with respect to claims **11, 12** and **14-22**have been considered but are moot in view of the new ground(s) of rejection.

Applicant has amended the claims to be of a scope not previously considered. Consistent with applicant's argument that the prior art relied on in the previous office action fail to show, disclose and/or teach certain aspects of applicant's invention now recited in the claims filed on **06/11/2008,** applicant has amended the claims to include the following:

Claim 11. (Currently Amended)

An afterburner for afterburning a residual gas from at least one of a reforming process and a fuel cell process, comprising:
at least one nozzle to meter fuel and the residual gas into a combustion chamber;
at least one device for providing an air supply; and
a heat-resistant, open-pore ceramic foam for at least partially filling the combustion chamber,
wherein the ceramic foam includes silicon carbide.

With regard to the invention now expressed in amended claim 11 related to the prior art reference of Forster applicant's response includes at least the following remarks:

> "Claim 11, as presented, relates to an afterburner for afterburning a residual gas from at least one of a reforming process and a fuel cell process, including, *interalia,* at least one nozzle, at least one device for providing an air supply, and a heat-resistant, open-pore ceramic foam for at least partially filling the combustion chamber, in which ***the ceramic foam includes silicon carbide.*** Support for these amendments may be found in the Substitute Specification, e.g., at page 4, lines 11 to 19; and canceled claim 13.
>
> Forster et al. do not identically disclose, or even suggest, all of the claimed features of claim 11, as presented. Nowhere do Forster et al. disclose that its flame guiding tube 4, or any of its three zones A, B, or C, includes silicon carbide.
>
> Therefore, Forster et al. do not identically disclose, or even suggest, the feature that ***the ceramic foam includes silicon carbide,*** as provided for in the context of claim 11, as presented."
>
> (Highlighting added)

The following examiner's action addresses the limitations defining the scope of the claimed invention now presented. In particular, applicant's attention is directed to the prior art reference of **US 20010028867 (Shimoda et al)** which at the time of the invention would have taught a person having ordinary skill in the art that the properties of a ceramic and silicon carbide containing porous foam material were known and useful as a suitable high temperature heat resistant material, suitable for supporting catalyst coating.

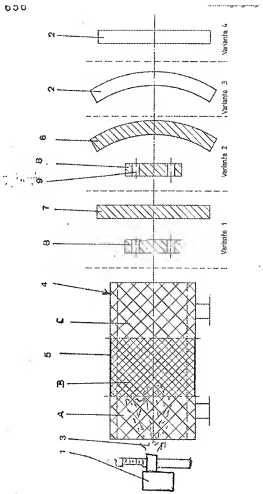
Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims **11, 12** and **14-22** are rejected under 35 U.S.C. 102(b) as being anticipated by **DE003732656A1** or **JP 59-131816** in view of **US 20010028867 (Shimoda et al).**

DE003732656A1 shows and discloses a burner gaseous fossil fuels, with a baffle located ahead of the burner that causes vortices in the combustion gases, in which a flame guiding tube (4) surrounding the burner flame (3), and made of an at least **partially open pored foamed ceramic material,** is located between the burner (1) and the baffle (2). The flame guiding tube (4) has three zones (A, B, C) of differing porosity, with the two outer zones (A, C) having essentially the same porosity, and the central zone (B) have a lesser porosity and being provided with a closed outer skin. A disc of open-pored foamed ceramic material may be provided in the passage of the **flame guiding tube (4).** Between the flame guiding tube (4) and the baffle (6, 7), another plate, of smaller extent than the baffle (6, 7), is located as a scattering plate (8); it may be provided with penetrations (9) for passage of the combustion gas, or be made of **foamed ceramic.** The parts may be made of a **catalytic material** (in the sense of effecting the conversion of noxious substances in the flue gas), or **coated with a material with such a catalytic effect.**



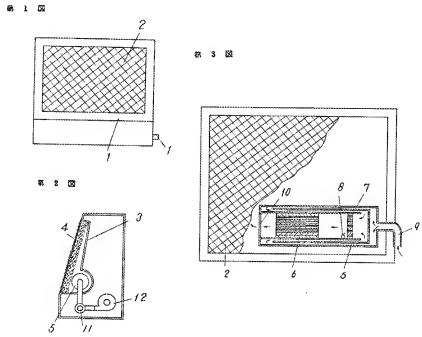
JP 59-131816 teaches, form applicant's same catalytic combustion field of endeavor field of endeavor, operating a foamed ceramic catalytic burner as an afterburner for consuming fuel produced in a **hydrocarbon gas reformer.**

JP 59-131816 discloses:

ABSTRACT:

CONSTITUTION: A **reforming unit 5** for **reforming hydrocarbon gas and** an **oxidation catalyst mat 4** for burning reformed gas are provided and the reforming unit 5 is held between the oxidation catalyst mat 4 and its rear surface panel 3. As reforming catalyst 6, **there is applied a catalyst** in which nickel, cobalt, iron, alkaline and alkaline earth, **platinum** etc. are held on an integrally formed body composed of grid-shaped or honeycomb-shaped multi-layered thin wall section made of non-organic heat resistant

material such as alumina, silica and cordierite **and the like**. As the oxidation **catalyst mat 4**, there are provided a wool- shaped non-organic **heat resistant material such as** alumina, **silica** etc. or material having simple metal or composite metals of iron, chromium, cobalt, manganese, **platinum** etc. held in **foamed** metal, **foamed ceramic** etc.



In regard to claims **11, 12** and **14-22**, for the purpose of providing a suitable known mean for combustion of fuel produced in a hydrocarbon gas reformer, it would have been obvious to a person having ordinary skill in the art to supply **DE003732656A1** with fuel produced in a hydrocarbon gas reformer and to utilize platinum a catalytic layer material, in view of the teaching of **JP 59-131816**.

US 20010028867 (Shimoda et al) teaches, form applicant's same catalytic reactor field of endeavor, forming "...**heat -resistant porous bodies** having communicating **pores**, a cell-sealed type **ceramic honeycomb** (400 cells/in.sup.2) of cordierite, and a **ceramic foam** of **silicon carbide** were prepared. Using **these heat -resistant porous bodies**, exhaust emission control devices were prepared by the same method as of Example 1, and evaluated. Table 5 shows the amounts of **platinum supported on the heat -resistant porous bodies** based on 100

parts by weight of the mixture of copper oxide and aluminum oxide, and the results of evaluation. The copper oxide used had a grain size of 1.1 .mu.m."

In regard to claims **11, 12** and **14-22**, for the purpose of providing a suitable alternative high temperature heat and corrosion resistant porous ceramic foam material, it would have been obvious to a person having ordinary skill in the art to form the **DE003732656A1** and/or **JP 59-131816** porous member(s) of a ceramic foam having silicon carbide, in view of the teaching of **US 20010028867 (Shimoda et al).** Furthermore, in regard to claims **14-22**, since the actual composition and pore structure a catalytic material, as well as the location and type of any one of an heater ignitor and nozzles would necessarily depend on numerous inter-related design parameters for a given burner apparatus, such as the overall size and shape of the apparatus, the actual composition of fuel burned, desired operating temperatures, etc. to operate a foamed ceramic combustor of the type represented by DE003732656A1 or JP 59-131816 to have a ceramic foam including silicon carbide, open pores via reticulation, include and electric heater, electric glow filament and a glow plug, ignitor location, nozzles, etc., can be viewed as nothing more than mere matters of choice in design absent e showing of any new or unexpected results produced therefrom over the prior art of record.

Conclusion

See the attached USPTO for, 892 for prior art made of record and not relied upon which is considered pertinent to applicant's disclosure.

US 5771683 A

TITLE: Active porous medium after treatment control system

The **foam member 30** may be made of any of a variety of known **conventional high temperature porous foams,** preferably of high temperature thermal shock and oxidation resistant metallic or ceramic composition. For example, the foam member 30 may be formed of zirconia, alumina, silicon nitride, silicon carbide or other similar materials. If the foam member 30 is formed of an **electrically conductive ceramic material**, **such as silicon carbide**, it can serve as one electrode of an ignition system for igniting the fuel-air mixture in the chamber 30, as described below in greater detail.

US 4777152 A

TITLE: **Porous silicon carbide sinter** and its production

Further, with respect to **porous sinters** having pores of a relatively larger sectional area, Japanese Patent Laid-Open No. 122016/1983, for example, discloses a process for producing an **electrically heat-generative silicon carbide** filter, comprising impregnating a polymer foam material with a **silicon carbide-based slurry**, eliminating said polymer foam material by heat treatment to **form** a **silicon carbide-based skeletal structure**, subjecting said structure to the primary baking in argon gas at a temperature of 1,900.degree. to 2,300.degree. C., subjecting it to the secondary baking in nitrogen gas at a pressure of 1 to 200 atm and a temperature of 1,600.degree. to 2,100.degree. C., and forming a heat -resistant electrode on each end of the structure to make it possible to pass an electric current therethrough, and Japanese Patent Laid-Open No. 81905/1973 discloses a process for producing a **porous ceramic material**, comprising impregnating an organic foam with a slurry containing a finely divided organic material, drying the foam thus impregnated, and baking the dried product, wherein the foam is impregnated with the slurry, after it is treated so that the particulate material in the slurry may adhere to the surface of the **foam structure**."

US 5117482 A

TITLE: Porous ceramic body electrical resistance fluid heater

"A **highly desirable ceramic** for this invention is one which is electrically conductive with a positive temperature coefficient of resistivity, **high temperature resistant, chemically inert**, and has low density and **high thermal conductivity**. One example of such a desirable **porous ceramic material** for this invention is **silicon carbid**e, **SiC**, which is **intrinsically electrically conducting,** i.e. without reliance on added materials for electrical conductivity, and embodies the other noted attributes. **Silicon carbide** can be produced by fusing sand and coke at a temperature above about 4000.degree. F. to form large crystals of silicon carbide which are then crushed to provide smaller grains primarily for extensive use as an abrasive, in the range from 100-1000 mesh. However, silicon carbide finds other uses such as high temperature semiconductors and cathodes, and will withstand high temperatures to its decomposition temperature of about 4200.degree. F. Silicon carbide may be produced as self-bonded low density and **high density silicon carbide foams**. Low density **silicon carbide foam** has a density of about 17 lbs/ft..sup.3 with a **90% porosity**, and high density **silicon carbide foam** has a density of about 33 lbs./ft..sup.3 with **80% porosity**. Also, various additive metals in small particle form may be added to a mass of silicon carbide crystals to increase crystal to crystal bonding or modify the electrical characteristics of all or a part of the sintered body. A high desirable electrical P.T.C. porous silicon carbide body may be closely matched in electrical and physical characteristics not only to its function of being utilized

as **an electrical heater** for a fluid passing therethough, but also matched to specific fluids. Silicon carbide has been found to be **desirably inert** to various **hot chemical process fluids** which are reactive to other porous body materials when rapidly heated to high temperatures while in contact with the porous body material. A preferred silicon carbide body of commensurate strength and electrical conductivity has a porosity in the range of from about 30% to about 50%.

THIS ACTION IS MADE FINAL

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

USPTO CUSTOMER CONTACT INFORMATION

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Carl D. Price whose telephone number is (571) 272-4880. The examiner can normally be reached on Monday through Friday between 9:00am-5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven B. McAllister can be reached on (571) 272-6785. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/CARL D. PRICE/
Primary Examiner, Art Unit 3749